

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 June 2004 (17.06.2004)

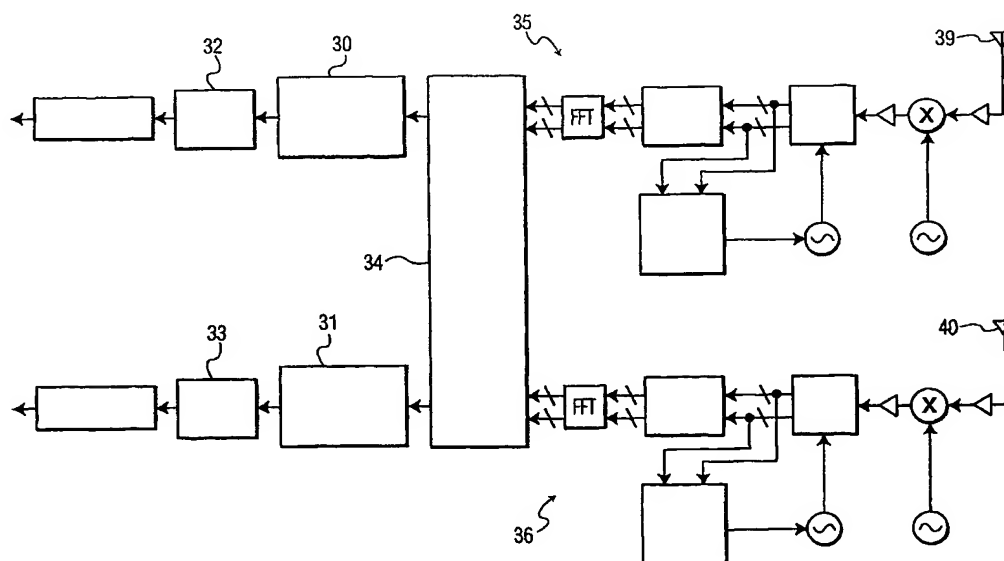
PCT

(10) International Publication Number
WO 2004/051914 A1

- (51) International Patent Classification⁷: **H04L 1/00**, 1/06, H04B 7/08
- (21) International Application Number: **PCT/IB2003/005277**
- (22) International Filing Date:
18 November 2003 (18.11.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/430,424 3 December 2002 (03.12.2002) US
- (71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **GHOSH, Monisha** [US/US]; P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US). **OUYANG, Xuemei** [US/US]; P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).
- (74) Common Representative: **KONINKLIJKE PHILIPS ELECTRONICS N.V.**; c/o WAXLER, Aaron, P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Declaration under Rule 4.17:**
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations

[Continued on next page]

(54) Title: A SIMPLIFIED DECODER FOR A BIT INTERLEAVED COFDM-MIMO SYSTEM



(57) **Abstract:** Multiple input multiple output (MIMO) systems are candidates for higher data rate wireless communication systems. Currently, for a single input single output (SISO) IEEE 802.11a system can provide a transmission data rate up to 54Mbps. The present invention is a 2 by 2 Multiple In Multiple Out (MIMO) system having a decoding apparatus that increases the data rate to over 100Mbps but at a computation cost about the same as for optimal decoding for a SISO system and 1/64 of the optimal decoding for a 2 by 2 MIMO system. At a bit error rate (BER) of 10⁻⁴ level, the 2 by 2 MIMO system of the present invention provides double the transmission data rate of the SISO system with approximately the same signal to noise ratio (SNR).